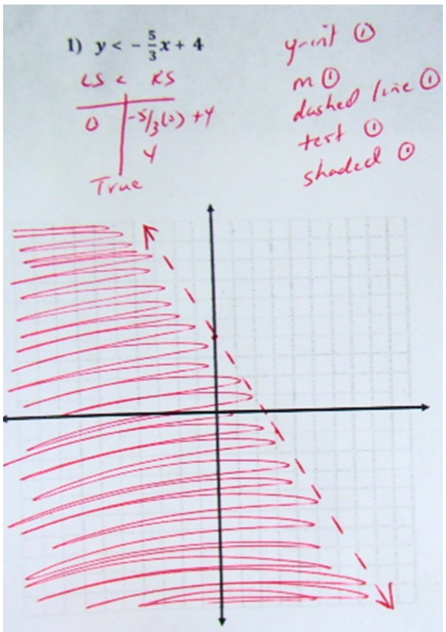
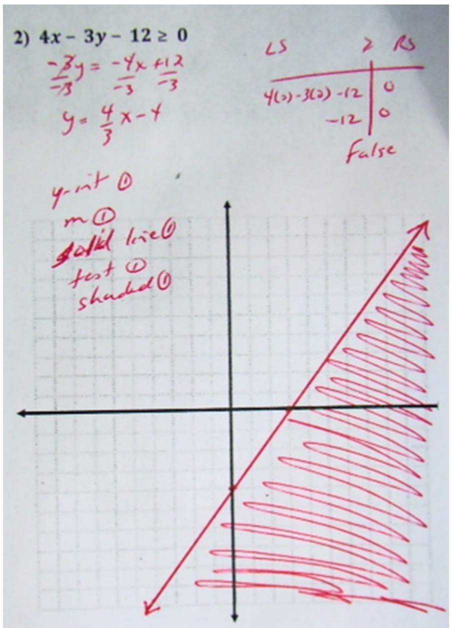
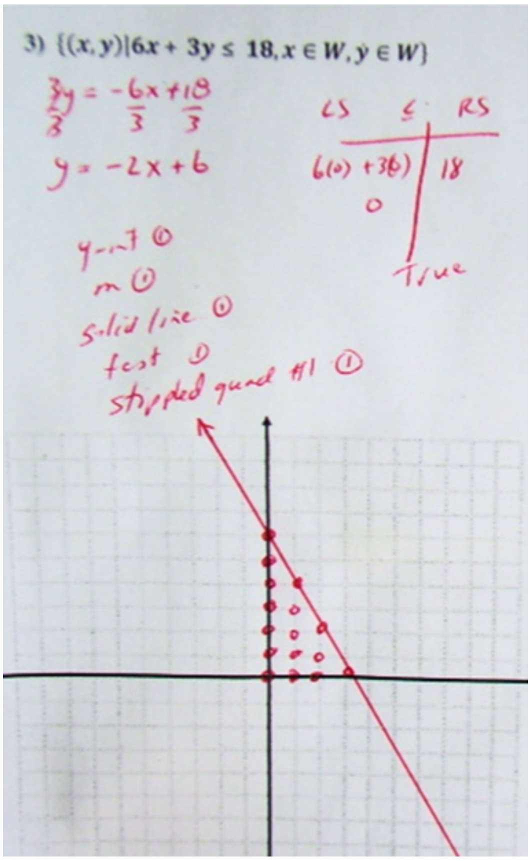
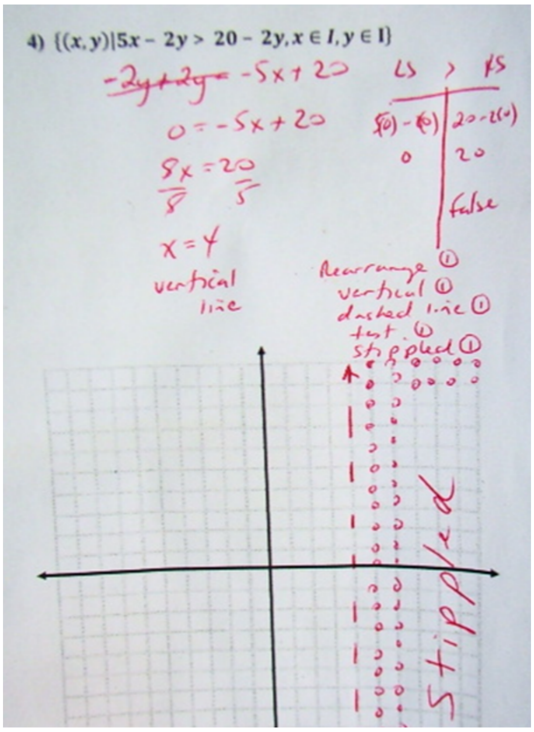
Quiz Solutions...









HOMEWORK???

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> **NOTE:**
>
> Create a model means graph the solution region

PRACTISING

3. A vending machine sells juice and pop.
   - The machine holds, at most, 240 cans of drinks.
   - Sales from the vending machine show that at least 2 cans of juice are sold for each can of pop.
   - Each can of juice sells for \$1.00, and each can of pop sells for \$1.25.

   Create a model that could be used to determine the maximum revenue from the vending machine.

(y) juice depends on pop (x)

$x \rightarrow$ # of cans of pop sold

$y \rightarrow$ # of cans of juice sold

$x \in W$ $y \in W$

Test (100, 100) $125 \geq 125$

100	2(100) 200
NO	

$x + y \leq 240$

$y \geq 2x$

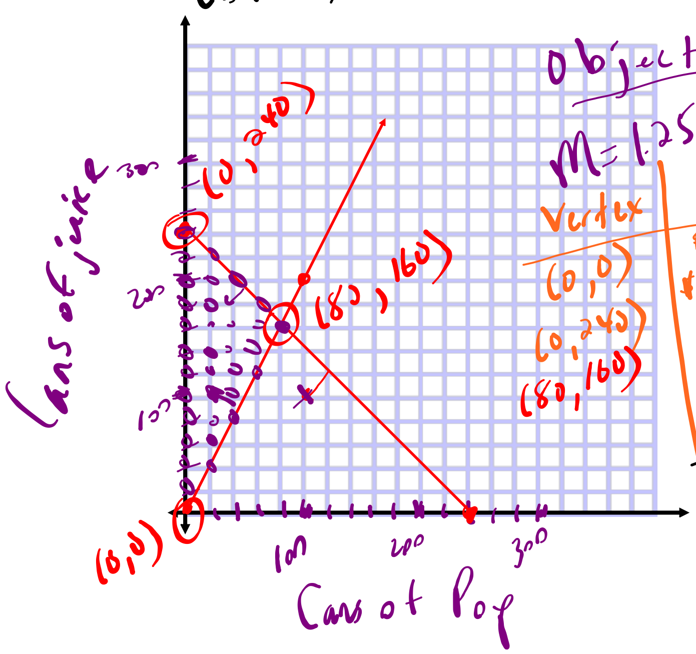
$x + y = 240$

$y = 2x$

x	y
0	0
100	200

x-int
$x + 0 = 240$
$x = 240$
$(240, 0)$

y int
$0 + y = 240$
$y = 240$
$(0, 240)$



Objective
$M = 1.25x + 1.00y$

Vertex	Objective
(0, 0)	\$0
(0, 240)	\$240
(80, 160)	$1.25(80) + 1(160)$ = \$260

EXAMPLE #1...

The vertices of the feasible region of a graph of a system of linear inequalities are (-4, -8); (5, 0) and (1, -6). Which point would result in the minimum value of the objective function C = 0.50x + 0.60y?

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* To find Min/Max => sub vertices into objective

Vertex	$C = 0.5x + 0.6y$
(-4, -8)	
(5, 0)	
(1, -6)	

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0.5(-4)+.6(-8)
            -6.8
0.5(5)+0.6(0)
             2.5
0.5(1)+0.6(-6)
            -3.1
```

Min

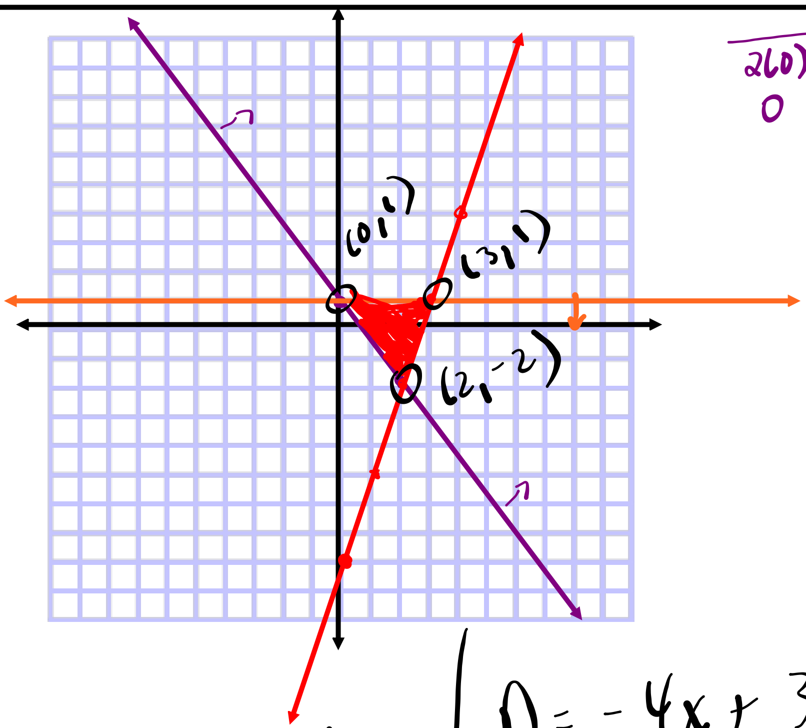
EXAMPLE #2...

The following model represents an optimization problem. Determine the maximum solution.

Restrictions: $x \varepsilon R$ and $y \varepsilon R$

Constraints: $y \le 1$; $2y \ge -3x + 2$; $y \ge 3x - 8$

Objective Function: $D = -4x + 3y$



Test (0,0)

$\frac{2y}{2} = \frac{-3x}{2} + \frac{2}{2}$

$y = -\frac{3}{2}x + 1$

LS $\ge$ RS	
2(0)	-3(0)+2
0	2
	No

y = 1 (horizontal)

y = 3x − 8

LS $\ge$ RS	
0	3(0)−8
	−8
	yes

Vertex	D = −4x + 3y	
(0,1)	-4(0)+3(1)	3 Max
(3,1)	-4(3)+3(1)	-9
(2,-2)	-4(2)+3(-2)	-14

EXAMPLE #3...

TOTAL $4 \times 12 = 48$

Four MVHS teams are travelling to a basketball tournament in cars and minivans.

- Each team has no more than 2 coaches and 10 athletes
- Each car can take 4 team members. Each minivan can take 6 team members.
- No more than 6 cars are available, but more than 3 minivans are available.

Mr. Watters wants to know the combination of cars and minivans that will require the maximum number of vehicles...

a) Create an algebraic model to represent this situation.

$x \to$ # of cars $\quad x \in W$

$y \to$ # of vans $\quad y \in W$

Objective

$V = x + y$

b) Graph the model.

$x \leq 6 \quad y \geq 3$

$4x + 6y \leq 48$

$4x + 6y = 48$

x-int

$4x + 6(0) = 48$

$x = 12$

$(12, 0)$

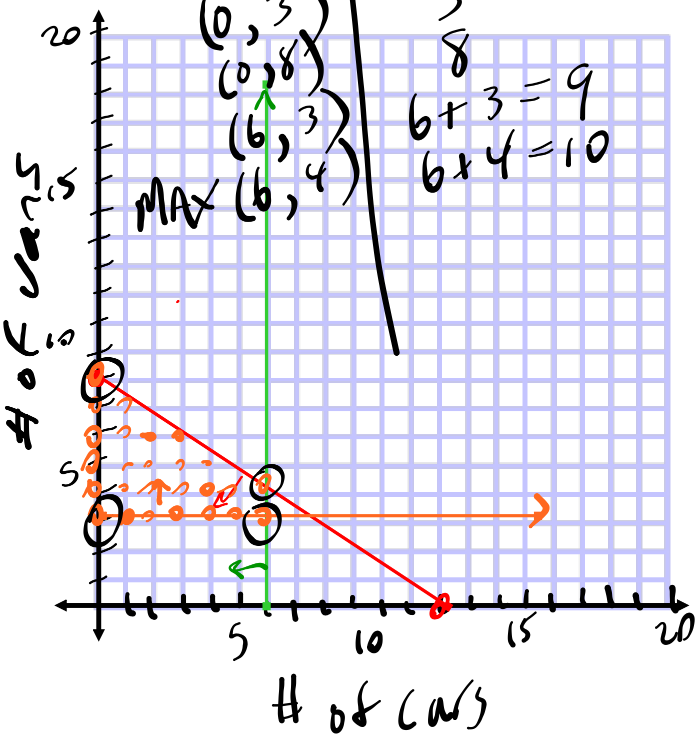
y int

$4(0) + 6y = 48$

$y = 8$

$(0, 8)$

Vertex	$V = x + y$
$(0, 3)$	3
$(0, 8)$	8
$(6, 3)$	$6 + 3 = 9$
MAX $(6, 4)$	$6 + 4 = 10$



c) What combination of cars/minivans will result in the maximum number of vehicles?

6 cars & 4 vans

d) How many team members can travel in the maximum number of vehicles?

$4(6) + 6(4)$

48 people

Practice Questions.,.

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